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# TIMBER RESOURCES FOR AMERICA'S FUTURE

(A Summary of the Timber Resource Review)

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By Richard E. McArdle, Chief, Forest Service,  
at Annual Meeting of the Society of American Foresters,  
Portland, Oregon, October 17, 1955

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Mr. Chairman, Members of the Society, and Guests:

I have a difficult assignment this afternoon--almost an impossible one. I am supposed to boil down three and one-half years of work on an extremely complex subject--our timber resources--by hundreds of individuals inside and outside the Forest Service, and give you the distilled essence in 30 minutes. Frankly, I think I'm going to run over a little bit, and I hope you won't mind too much if I do.

I welcome the chance to give the first report on the Timber Resource Review at this annual meeting of the Society. I think this is the right forum for the TRR. The report of the Timber Resource Review is a technical one, and on a technical subject. This is the only technical forum of foresters that I know of where representatives will be present from most of the various agencies and groups, private and public alike, who participated in both the planning phases and the field surveys. It would be a mistake to believe that the report of the Timber Resource Review is, or should be, like a Reader's Digest discussion on some popular topic of the day. We are dealing with one of America's basic natural resources, and over-simplification can be dangerously misleading.

First I want to take about 10 minutes to explain a few things about the TRR and then give you some of the highlight findings.

This report of the Timber Resource Review is roughly analogous to a State of the Union report on our timber supplies, both present and prospective. This is the sixth of these periodic, over-all appraisals in which the Forest Service has had a hand. The last one was the Reappraisal Report of about 10 years ago.

A year and a half was devoted to planning the TRR; roughly a year was taken up by collection of data and field surveys, and about a year to compile, summarize the figures, and to write the review draft reports.

One of the unique things about the TRR which distinguishes it from its predecessors is that it was done with a great deal of collaboration by State agencies, forest industries, and others. This made it a much better job than the Forest Service could have done by itself. We have had from the start a national advisory group of 13 different organizations. During the planning phases and the field surveys there were countless meetings and discussions which helped shape the scope of the study and its execution. The Forest Service had about half a million dollars' worth of assistance in one form or another. Sixty-five State agencies collaborated in 37 different States and accounted for 70 percent of all assistance. Collaboration from forest industry came from 149 different sources, including many individual lumber and pulp and paper companies. Then in addition, there were the thousands upon thousands of individual landowners who gave access to their properties. There were only half a dozen cases in the whole country in which such access was denied.

The TRR differs from other Forest Service studies of this general nature in numerous other ways. For one thing, there are no program recommendations in the report. We do not say what should be done, nor who should do it. This is a factual report, plus Forest Service interpretation of what those facts mean. Every effort has been made to present the factual information and the interpretive discussion in a straight-from-the-shoulder, right-down-the-middle approach. We try not to color those facts. We tell you our thinking about them, but we try to present them in such a way as to leave it up to you to do your own thinking.

Now I expect you want to see one of the TRR reports. Well, here it is, all 9 pounds and 9 chapters, including 5 appendices. You can see from the list of chapters on the last page of my talk that they cover such subjects as our supply of forest land and timber, growth and utilization of timber, future wood requirements, protection against destructive agencies, planting, ownership, condition of recently cut lands, and so on. Here, for example, is the statistical appendix of some 78 detailed resource tables, many of them on a State basis. I think this statistical appendix will be a reference source for years to come.

Here is Chapter I, which is a summary of the other 8 chapters. This is what most of you will read. What I'm going to give you in a few minutes are the boiled-down highlights from this summary chapter. So you are getting the result of double distillation. First there's the complete report which I have just shown you, then there is the summary of that complete report, which is Chapter I, and then there is the summary of the summary which appears at the end of Chapter I and which I am going to read to you today.

The initial reaction of some who have seen the report is--why does it have to be so big? My answer again is that this is a tremendously complex subject. I can say with all modesty because I did not participate directly in its preparation that the TRR report is a monumental job. Let's not undersell forestry by a tendency to over-simplification. This is a technical report on a technical subject, and you as foresters should welcome the opportunity to study and digest it. Perhaps I should also warn that no one who reads only the 21 highlights should assume that they have the complete findings of the TRR. As a minimum you should read all of the summary chapter.

How do you get a copy of this report? The answer is that many of you will not be able to get a complete copy right away. This is only a review draft. We've processed 3,000 copies of the summary chapter and 1,500 copies of the rest. Counting the distribution that is being made in the Forest Service and to our national advisory organizations, about a thousand copies are in the mails right now. Most of these are going outside the Forest Service. Every State Forester will get three copies. Each forestry school will get a copy. A large number of copies are being sent to member organizations of our national advisory group, among which are represented the various segments of forest industry and other groups. If the demand is such, we will run off additional copies, but since this is a review draft and will be revised prior to final publication, it seemed best not to make many copies at the outset.

I hope the facts and findings of the Timber Resource Review will be widely discussed, understood, and debated. The next several months will be a review period, and we invite your comments.

Enough for the preliminaries and explanation. I want to read to you now the 21 highlights. This is the summary of the summary taken as it appears at the conclusion of Chapter I. Because of time limitations I may have to omit some of the points, but if I do, they are there for you to study. If you don't already have a copy of this paper, there are plenty available. I don't believe you can absorb all of the 21 highlights at the first reading. I know I couldn't. My suggestion is to take them home and think about them, and to get a copy of the summary, Chapter I, as soon as you can. Here are the highlights:

## TWENTY-ONE HIGHLIGHTS

### 1. Continued expansion of the Nation's economy is expected

Any appraisal of future supply and demand for natural resources involves a choice between such basic assumptions as prosperity or depression, population growth or decline, rising or falling standards of living, and peace or war. The Timber Resource Review is geared to a continued rapid rise in population; economic prosperity and higher living

standards as reflected in a continued rise in gross national product; and expectations of peace but continued military preparedness.

One of the most fundamental assumptions is that the population of the United States will be 210 million in 1975 and 275 million in 2000, as contrasted to an estimated 165 million in 1955. This would be an increase of 67 percent for 2000 above that of 1955, but the trend is about the same as prevailed during the first half of the twentieth century.

Gross national product--the total national output of all goods and services--is estimated to increase from 365 billion dollars in 1952 to 630 billion in 1975 and 1,200 billion in 2000. Although this would be an increase of 229 percent from 1952 to 2000, this trend also is about the same as the actual rate of increase over the past 50 years.

## **2. Potential demand for timber products is strikingly upward**

Two sets of estimates of potential demand were developed for both 1975 and 2000. One set--the so-called "lower level" estimates--was derived from a projection of past consumption trends, product by product, as influenced by the basic economic assumptions. These estimates reflect a relative decrease in the use of wood, declining per capita consumption, and an increase in real price. The other set--the "upper level" estimates--is based on the assumption that wood will continue to occupy about the same place that it does now in the national economy and will continue to make up the same proportion of consumption of all physical structure raw materials as at present. Both the lower and upper level estimates indicate substantial increases over 1952 in the amounts of wood which would be consumed.

The lower level estimate for 2000 indicates that demand for industrial wood (all wood except fuelwood) would be 67 percent greater than 1952 consumption. But even with this large absolute increase there would be a decline in annual consumption per capita from 65 to 62 cubic feet.

The upper level estimate for 2000 indicates that demand for industrial wood would be 105 percent above 1952 consumption. This would mean a per capita increase from 65 to 76 cubic feet.

In actual figures potential demand estimates for the year 2000 are 18 and 22 billion cubic feet for the lower and upper level estimates respectively, in contrast to 1952 consumption of some 12 billion cubic feet. These potential demand estimates would require a timber cut of 69 and 95 billion board feet of sawtimber in contrast to the 1952 cut of 49 billion board feet.

## **3. The United States must rely chiefly on domestic timber resources--with which it is fairly well endowed, compared to other nations**

The United States including all of Alaska, controls 8 percent of the forested area of the world and 15 percent of the timber under exploitation. Although the area is less than that of some nations, the timber volume is greater than that of most. Canada, for example, has more forest area but less timber than the United States, including Alaska. There are about 4 acres of forest land per capita in the United States, about 9 acres per capita in the U.S.S.R., and about 66 acres per capita in Canada.

In terms of the softwood timber resource, the United States has about 14 percent of the area and 20 percent of the timber volume. Although Canada has a greater softwood area, it has about half as much softwood volume as the United States. More than half of the world's softwood forest area and timber volume belongs to the Soviet Bloc of nations.

It is likely that United States imports from Canada will increase but mainly in terms of pulpwood, pulp, or paper. The extent of Canadian resources, the Canadian potential for increased forest growth, the outlook for expansion of the domestic economy of Canada, and the other demands upon Canada for export of her forest products, all point to some

increase in United States imports but in amounts insufficient to contribute materially toward satisfying the increased demand in the United States.

#### 4. The Nation has no excess of forest land

Earlier national appraisals of the timber situation have concluded that there is ample forest land to grow needed timber crops in the United States if the land is effectively used. This is no longer clearly apparent. The long-time trend in the Nation's forest land has been distinctly downward as land has been cleared for agriculture, as highways have been built, and as towns have sprung up and urban areas expanded. There has been no great net change in the area of forest land in recent decades despite a small net increase since 1945. In all probability the long-term downward trend will continue due to expected increases in population, further urbanization, continued highway and power developments, and expansion of agriculture. Considering both this trend in land use and the estimates of potential future demand, it is no longer a clear-cut conclusion that there is ample forest land. On the contrary, further significant reductions in the acreage of land devoted to growing trees should in general be avoided or should be made with full realization that such withdrawals may adversely affect future timber supplies.

#### 5. One-fourth of the forest land is poorly stocked or nonstocked

There are 115 million acres of commercial forest land in the United States which are less than 40 percent stocked. This is about one-fourth of the total commercial forest area, and it includes some 42 million acres which are less than 10 percent stocked. Thus, one-fourth of the forest land is not growing and will not grow timber to anywhere near the productive capacity of the land unless stocking is greatly improved. Moreover, there is a large but undetermined additional acreage which is 40 to 70 percent stocked. These facts mean that the Nation is not making effective use of the land now devoted to forest production.

#### 6. Three-fourths of the forest land is in the East but two-thirds of the sawtimber volume is in the West

The great bulk of the commercial forest land is in the more heavily populated and industrialized eastern half of the country, with three regions, the Southeast, Lake States, and West Gulf Regions, having 40 percent of the national total. On the other hand, the West, including Coastal Alaska, with only one-fourth of the commercial forest area, has 70 percent of the sawtimber volume. This is due mainly to heavy stands on the 50 million acres of remaining western old-growth timber. Three States--Oregon, California, and Washington--have about half of the Nation's sawtimber. This great difference in the geographical distribution of forest land in contrast to that of standing timber means that ultimately there will be a significant readjustment in forest industries and of timber cut in order to bring them more in harmony with the location of forest land and its productive capacity.

#### 7. Timber volumes about the same as in 1945

Direct comparisons of timber volumes between those reported by the Timber Resource Review and by the appraisal of the timber situation conducted by the Forest Service in 1945 are not possible. In order to be compared, standing timber volumes need to be adjusted to the same standards.

The 1953 sawtimber volume is 1,968 billion board feet (excluding Coastal Alaska), which is 2 percent below the adjusted 1945 volume. Sawtimber comparisons show that eastern softwoods declined 2 percent, eastern hardwoods increased 9 percent, and western species declined 5 percent. The 1953 volume of growing stock of 498 billion cubic feet is 2 percent above the adjusted 1945 volume. The most significant features of these trends are the increase in eastern hardwoods and the small decrease in eastern softwoods. The latter should be substantially increasing if future potential demands are to be met.

## 8. Heavy reliance placed on small group of species

Douglas-fir and ponderosa pine account for 37 percent of the sawtimber volume; southern yellow pines and the oaks for 45 percent of the sawtimber growth; and Douglas-fir and southern yellow pines for 48 percent of the cut. Thus, it is evident that heavy reliance is placed on a small group of species although they vary in importance depending upon whether volume, growth, or cut is the criterion.

Western true firs and western hemlock are important in terms of sawtimber volume, accounting for 17 percent of the total, but are relatively unimportant at the present time in terms of growth and cut.

## 9. Timber quality is declining

There is much evidence that standing timber is declining in quality: 10 percent of total timber volume is in cull trees; two-thirds of eastern hardwood sawtimber would probably classify as Grade 3 logs; one-fourth of eastern softwood sawtimber is in the smallest sawtimber diameter class; preferred species or types are gradually being replaced in many areas; and the proportion of total timber volumes in the larger trees is decreasing. This decline in timber quality is an undesirable trend although not yet a vital factor nationally.

Despite the technological advances which offset in part the need for quality, it is believed that declining quality will become more, instead of less, of a problem during the next several decades.

## 10. Timber growth is increasing

One of the most favorable factors in the timber situation is that growth is increasing. On a national basis, sawtimber growth was nearly 9 percent more in 1952 than the adjusted growth in 1944. Eastern softwood sawtimber growth is estimated to be 12 percent greater than in 1944 and hardwoods 15 percent greater. One-half of all sawtimber growth occurs in the South, with nearly one-third of the total on southern yellow pine.

In the West, sawtimber growth decreased 3 percent between 1944 and 1952. As old-growth areas in the West are cut and more second-growth stands reach measurable size, western growth should substantially increase.

## 11. Most eastern species now have favorable growth-cut ratios

Over-all growth-cut comparisons tend to be misleading because they may conceal the often quite different hardwood and softwood comparisons. Likewise, over-all comparisons include the growth-cut situation in the West which is distorted by the large amounts of residual old growth. Furthermore, balances between growth and cut have little meaning unless the inventory is large enough to meet future potential demands.

However, it is significant that eastern softwood sawtimber growth was 20 percent greater than cut in 1952 and hardwood sawtimber growth was 57 percent greater than cut. The favorable softwood growth-cut ratio was brought about as much by a 16 percent reduction in cut as by a 12 percent increase in growth. Most eastern species now have favorable growth-cut sawtimber ratios, although they continue unfavorable for a few preferred species. In the West, the ratio of growth to cut was less than in 1945 due to a decrease in growth and an increase in cut.

## 12. One-fourth of timber cut not utilized

Of the timber cut in 1952, one cubic foot out of every four was not utilized. Unused plant residues and logging residues were about equal in volume and totaled nearly 3 billion cubic feet. One-third of the timber cut for lumber was not used, either for fuel or any other purpose. On the other hand, only 4 percent of the timber cut for pulpwood was

19. The key to the Nation's future timber supplies lies with the millions of farm and "other" private holdings

The greatest advancements in forestry, the best conditions on recently cut lands, and over half the Nation's inventory of softwood sawtimber occur on forest industry and public land. The 23,000 forest industry ownerships account for 13 percent of the commercial forest land; public lands, 27 percent.

In contrast, the farm and "other" private ownerships have the poorest cutover conditions, are largest in total area, largest in number of owners, and potentially the largest in total timber volumes. Eighty-five percent of these 4.5 million ownerships are in forest holdings of less than 100 acres, and 50 percent have holdings of less than 30 acres.

Unquestionably, the heart of the forest problem of the United States lies with the 3.4 million farm owners and the miscellaneous group of 1.1 million "other" private ownerships. Although they own mainly very small tracts of forest land, and their principal interests usually are not timber growing, in the aggregate they control well over half of the Nation's commercial timberland and they must continue to supply a substantial portion of the raw materials for forest industry.

20. Growth and inventory needed to sustain potential demands will be much greater than at present

Comparison of present levels of growth and inventory with how much is needed helps to indicate how easy or difficult it may be to meet future demands on a sustained basis.

Estimates of needed growth in 2000 range from 79 to 105 billion board feet of sawtimber, or from 67 to 122 percent above 1952 levels. The lower estimate is based on a lower level demand which reflects a relative decrease in the use of wood, declining per capita consumption, and an increase in the real price of timber products. The upper estimate assumes that wood will continue to occupy about the same role as at present in the national economy.

By 2000, eastern softwood sawtimber growth would need to increase 90 to 154 percent, eastern hardwoods 15 to 52 percent, and western species 121 to 194 percent, depending on whether needs are geared to lower or upper level estimates of demand.

Considering all species together, the changes needed in standing timber inventory are not nearly so pronounced. Although a slight decrease would be possible and still meet lower level demands, about a one-third increase in sawtimber inventory would be needed to sustain the upper level. The needed increases in inventory of eastern species are relatively greater than the needed growth increases for these species. These are offset in part by allowable decreases in the inventory of western species.

21. Potential demands pose tremendous challenge to American forestry

A comparison of the growth and inventory that may be expected in the future with what may be needed to sustain future demands is more significant than comparing future needs with current levels. Projected growth and inventory are what might be expected in the future if all demands are met in the meantime, and if current trends in forestry continue.

Projected sawtimber growth in 2000 ranges from 67 to 25 billion board feet, or from 16 to 76 percent below needed growth for the lower and upper levels of demand respectively. By 2000 eastern softwood sawtimber growth would range from 29 percent below needed growth down to negligible amounts, eastern hardwoods from 16 percent above to 58 percent below, and western species from 28 to 61 percent below, depending on whether timber cut had been geared to lower or upper level demands in the meantime.

Projected sawtimber inventory in 2000 ranges from 2,002 to 968 billion board feet, or from 6 percent above to 65 percent below needed inventory for the lower and upper levels

of demand respectively. Eastern softwood inventory would be seriously affected under either level of demand but under the impact of meeting upper-level demands, the inventory of both eastern and western species would be less than half of needs.

In general, the long-range effect of meeting either level of demand would be about the same. The difference is that the effects would be delayed and less pronounced with respect to the lower level. If upper-level estimates of demand are met until the end of the century the Nation would be facing serious wood-supply problems before that time, especially in softwood sawtimber. Even hardwood sawtimber would be decreasing. If the lower-level estimates prevail, softwood growth by the end of the century would be considerably below that needed to sustain demand.

To fully appreciate the significance of these interpretations, it is essential to bear in mind they are predicated upon a continuation of recent trends in forestry progress. If existing levels of forestry had been assumed and no recognition given to probable intensification, the outlook would be far less favorable.

Forestry is not a short-time proposition. Where this Nation stands in timber supply at the end of the century depends largely on actions taken during the next two decades. Rapid acceleration of recent encouraging forestry trends is vital if the timber resources of the Nation are to be reasonably abundant 50 years hence. Because of the magnitude of potential demand, and the difficulty of extending more intensive forestry to the millions of small holdings, time is important. The potential of the land is adequate. Our challenge is to make better use of it soon.

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That concludes the 21 highlights. I think you see now what I meant at the start when I said they wouldn't all sink in at one time.

All generalizations are dangerous. This is especially true of generalizations dealing with a complex technical subject like the timber resources of a whole nation. We found it out when we tried to write the TRR summary; we found it out even more when we wrote the 21 highlights. They don't adequately describe the situation. It isn't that simple. Over-all comparisons of growth and drain, for example, are almost meaningless. So my suggestion is: As a minimum read the summary chapter. Do more than just read it. Study it. Again, I say, this is a technical subject. Don't let yourself be drawn into the trap of over-simplification.

We all know that there has been a lot of progress in forestry in recent years. The TRR confirms this. As a forester I personally take a good deal of pride in that progress. I know you do, too. I think also we will all take much satisfaction in the evidence of the TRR that by and large our timber situation isn't getting worse, and in some respects is getting better.

But whether the situation is getting better isn't too much to the point. We can't consider forestry in a vacuum. It isn't enough for present forestry trends to continue; we must consider those trends in relation to population and other things in the national economy that will influence future demand for timber. Population, for example, is going to increase whether we like it or not. So we must look ahead. I want to make it as plain as I possibly can that we foresters have a tremendous task ahead to get this country's forests geared up to meet the demands that will surely be on them in the not-very-distant future.

Whether there is time enough to gear up to levels of future demand by the end of the century--and still meet increasing needs in the meantime--is a pretty debatable question. I can tell you one thing, for sure: whatever role foresters have occupied in the past, they are going to be a lot more important in the future.

If we accept the assumption that the population of the United States is going to keep on increasing at a rapid rate, and if we accept the estimates of potential timber demand at all seriously--and you certainly can't ignore them--it is going to require an intensification of forestry effort above and beyond what most of us have visualized.

Unless you are willing to sell forestry short--and I don't believe you are; unless you believe that timber products will occupy an ever-decreasing role in our supply of raw materials--and I don't believe you do; unless you are satisfied with continually rising prices--and I don't believe you or anybody else will be; there is no basis for smugness or complacency in our present situation. Instead, we ought to recognize that we foresters have a real job ahead of us. We ought to have the feeling: "Let's roll up our sleeves. Let's get together--and get to work--today!"

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## ORGANIZATION OF THE TIMBER RESOURCE REVIEW REPORT

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